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Research note

Evaluation of the infectivity of *Trichinella* spp. for reptiles (*Caiman sclerops*)

Christian M.O. Kapel^{a,b,*}, Pia Webster^a, Henrik Bjørn^b, K. Darwin Murrell^c,
Peter Nansen^a

^aDanish Centre for Experimental Parasitology, The Royal Veterinary and Agricultural University, 13 Bülowsvej, DK 1870
Frederiksberg C., Denmark

^bDanish Veterinary Laboratory, 27 Bülowsvej, DK 1790 Copenhagen V., Denmark

^cAgricultural Research Service, US Department of Agriculture, Beltsville, MD 20705, USA

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Abstract

Experimental inoculation with nine well-characterised *Trichinella* isolates was performed on caimans (*Caiman sclerops*) to determine their infectivity for reptiles belonging to the family Crocodylidae. As controls, the same larval batches of *Trichinella* isolates were inoculated into mice and guinea pigs. It was suggested that *Trichinella pseudospiralis* was more likely to infect reptiles than encapsulating species, but whereas all *Trichinella* species established in mice and guinea pigs, the caimans remained negative. The finding that caimans could not be experimentally infected contrasts with a recent report on infections in farmed crocodiles (*Crocodylus niloticus*). © 1998 Australian Society for Parasitology. Published by Elsevier Science Ltd. All rights reserved.

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A recent communication described infection of the crocodile, *Crocodylus niloticus* (Crocodylidae), with nematode larvae considered to belong to the genus *Trichinella*. The infection was found at high prevalence (40%) and intensity (up to 37 larvae per gram of musculature) in the tissues of commercially farmed crocodiles from Zimbabwe [C.M. Foggin, G.D. Vassilev and Widdowson M.A. Infection with

Trichinella in farmed crocodiles (*Crocodylus niloticus*) in Zimbabwe. Abstract book on the 16th International Conference of The World Association for the Advancement of Veterinary Parasitology, 10–15 August 1997, Sun City, South Africa. Abstract no. 110]. However, nematodes from this study have yet to be identified unequivocally by morphological and molecular characters [1] at the *Trichinella* Reference Centre (TRC) in Rome [2]; hence the taxonomic position of this nematode remains unclear. None the less, if the nematode represents a genotype of *Trichinella*, then the practice of feeding offal in reptile farming would greatly enhance transmission, creating a significant

*Corresponding author. Present address: Danish Centre for Experimental Parasitology, The Royal Veterinary and Agricultural University, 13 Bülowsvej, DK 1870 Frederiksberg C., Denmark. Fax: (45) 35 28 27 74; e-mail: chk@kvl.dk.

threat to humans consuming crocodile meat and thus to the viability of commercial crocodile farming. There are no reports of *Trichinella* spp. infecting poikilotherm hosts, making the findings from Zimbabwe controversial. None the less, the non-encapsulating *Trichinella pseudospiralis* (genotype T4) can infect both birds and mammals, indicating that this species, from an evolutionary viewpoint, is more likely to infect reptiles than any of the encapsulating species of the genus which infects only mammals. To evaluate this, nine well-defined *Trichinella* (Table 1) isolates, provided by TRC and maintained in mice, were experimentally inoculated in reptiles (*Caiman sclerops*) belonging to the family Crocodylidae. Additionally, laboratory mice and guinea pigs were infected with the same larval batches to prove the infectivity of each isolate. The caimans, approximately 25 cm in length, were kept in a vivarium with sand and water. Heating lamps maintained the temperature at 29°C in the sand. The caimans were allowed to adapt to the experimental conditions for 2 weeks prior to inoculation. They were fed ground meat and pieces of fish or shrimp twice weekly. Initially, two reptiles, eight

mice, and three guinea pigs were inoculated with 1000, 500 and 1000 larvae, respectively, for each of the *Trichinella* isolates. For this, muscle larvae were isolated by artificial HCl-pepsin digestion and sedimentation [3]. Larvae suspensions were administered to the experimental animals by means of a feeding needle fitted on a syringe. Two and 4 days later the reptiles were re-inoculated with 1000 larvae, whereas mice and guinea pigs were not. To vary the way of administration, the last of these re-inoculations were fed to the reptiles in meat balls. All animals were sacrificed 5 weeks after the primary inoculation. The entire carcass of mice and crocodiles and 50 g of mixed muscle tissue from the guinea pigs were HCl-pepsin digested and sedimented [3]. For digests of the reptiles the whole sediment was examined, and subsamples from digests of mice and guinea pigs were examined. The reproduction capacity index (RCI) was calculated as the number of muscle larvae recovered per inoculated larvae. In the case of the guinea pigs, the total number of muscle larvae was extrapolated from the number recovered in the 50-g subsample.

All mice and guinea pigs were highly infected,

Table 1

Reproductive capacity index of *Trichinella* spp. in experimentally infected mice, guinea pigs and caimans

Species	Genotype	TRC code ^a	Caimans		Mice		Guinea pigs	
			N	RCI ^b	N	RCI	N	RCI
<i>Trichinella spiralis</i>	T1	ISS004, Maryland, USA, <i>Sus scrofa</i>	2	0	8	88	3	629
<i>Trichinella nativa</i>	T2	ISS042, Alaska, <i>Ursus maritimus</i>	2	0	8	15	3	420
<i>Trichinella britovi</i>	T3	ISS100, Italy, <i>Canis lupus</i>	2	0	8	40	3	178
<i>Trichinella pseudospiralis</i>	T4	ISS470, Alabama, USA, <i>Coragyps atratus</i>	2	0	8	39	3	220
<i>T. pseudospiralis</i>	T4	ISS013, Caucasus, USSR, <i>Procyon lotor</i>	2	0	8	36	3	192
<i>T. pseudospiralis</i>	T4	ISS141, Australia, <i>Dasyurops maculatus</i>	2	0	8	12	3	262
<i>Trichinella</i> sp.	T5	ISS035, Pennsylvania, USA, <i>Ursus americanus</i>	2	0	8	12	3	201
<i>Trichinella</i> sp.	T6	ISS034, Montana, USA, <i>Ursus arctos</i>	2	0	8	85	3	78
<i>Trichinella nelsoni</i>	T7	ISS037, Tanzania, Africa, <i>Phachocercus aethiopicus</i>	2	0	8	53	3	443

^aTRC code: designation used by the *Trichinella* Reference Centre [2] (catalogue number, origin, and original host).

^bRCI: reproductive capacity index (larvae recovered/larvae inoculated).

whereas all caimans were negative Table 1. Thus, the hypothesis that one of the *T. pseudospiralis* isolates may establish in reptiles could not be verified. The inability to infect *C. sclerops* with any of the currently recognised genotypes of *Trichinella* contrasts with the high prevalence and intensity of the findings in the farmed *C. niloticus*, and suggests that the nematode found in Zimbabwe may not represent *Trichinella*, particularly given that the host spectra of *Trichinella* spp. are broad. However, there is a possibility that the nematode may represent a new taxon of *Trichinella* with different bio-

logical characteristics to those of currently recognised species. This should be investigated.

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